**State of Illinois**
**Department of Transportation**
**Bureau of Materials and Physical Research**

**POLICY MEMORANDUM**

| January 1, 2006 | Springfield | 06-02 |
|---|---|---|

TO: REGIONAL ENGINEERS, HIGHWAY BUREAU CHIEFS, AND PORTLAND CEMENT MANUFACTURERS

SUBJECT: PORTLAND OR BLENDED CEMENT ACCEPTANCE PROCEDURE FOR QUALIFIED AND NON-QUALIFIED PLANTS

DEFINITIONS

**Agent** - One who acts for or as the representative of a cement company.

**Acceptance (ACC) Sample** - A sample used for accepting/rejecting cement prior to its use on Department projects and/or unassigned stock for future use on projects. The quantity represented by acceptance samples must be given.

**Bureau** - Bureau of Materials and Physical Research, 126 E. Ash Street, Springfield, IL 62704-4766.

**CCRL** - Cement and Concrete Reference Laboratory.

**Cement** - Portland Cement or Blended Hydraulic Cement.

**Composite Sample** - Combined grab samples taken at prescribed intervals over a period of time.

**Department** - Illinois Department of Transportation.

**Grab Sample** - A sample secured from a conveyor, from bulk storage, or from a bulk shipment in one operation.

**Independent Assurance (IND) Sample** - A sample used to provide an independent check on the reliability of the manufacturer's quality control program.

**Investigation (INV) Sample** - A destination sample used to verify the acceptability of cement from a plant.

**Manufacturer** - A Cement Manufacturer. The term Producer is also used.

**NIST** - National Institute of Standards and Technology

**Non-Qualified Plant** - A Plant that ships cement which must be sampled, tested, and approved by the Bureau before it is used on Department projects.

**Plant** - Cement Manufacturing Plant.

**Preliminary (PRE) Sample** - A sample used to determine, in advance, if the cement will comply with Department specifications.

**Processing Addition** - An addition introduced to aid in the manufacture or handling, or both, of a hydraulic cement. This is according to ASTM C 219-03.

**Process Control (PRO) Sample** - A sample used for the purpose of controlling production of cement proposed for incorporation into Department projects. Note: ASTM C 917 samples taken by the manufacturer may be used as PRO samples.

**Qualified Plant** - A Plant that is qualified by the Bureau to ship cement for immediate use on Department projects.

**Supplier** -A company who supplies cement which it has not manufactured.

## 1.0 PURPOSE

1.1 To establish procedures whereby **Cement** furnished by a **Manufacturer** or **Supplier** will be accepted for use on **Department** projects.

## 2.0 SCOPE

2.1 This procedure is available to all **Manufacturers** and **Suppliers** of domestic and foreign **Cements**. However, only **Plants** in North America may apply for **Qualified Plant** status.

## 3.0 SPECIFICATION REQUIREMENTS, SAMPLING, AND TEST PROCEDURES

3.1 **Cements** used on **Department** projects shall meet the material requirements of the **Department's** "Standard Specifications for Road and Bridge Construction (January 1, 2002)" and current special provisions.

3.2 Portland cements used on **Department** projects shall meet the standard physical and chemical requirements of ASTM C 150, "Standard Specification for Portland Cement."

3.3 Blended hydraulic cements used on **Department** projects shall meet the standard physical and chemical requirements of ASTM C 595, "Standard Specification for Blended Hydraulic Cement." In the case of blending Portland cement and ground granulated blast-furnace slag, the cement shall be from a **Qualified Plant** and the ground granulated blast-furnace slag shall be from an approved source.

3.4 **Processing Additions** used in the manufacturer of **Cements** shall meet the requirements of ASTM C 465, "Standard Specifications for Processing Additions for Use in the Manufacture of Hydraulic Cements."

The bill of lading shall state if granulated blast-furnace slag or Class C fly ash has been used as a **Processing Addition**. The bill of lading shall also have a statement that indicates the inorganic **Processing Addition** is not in excess of 4.0 percent by mass (weight) of the **Cement**.

3.5 For portland cement according to ASTM C 150, the bill of lading shall state the **Cement** contains a limestone addition if it has been added. The bill of lading shall also state that the limestone addition is not in excess of 5.0 percent by mass (weight) of the **Cement**.

3.6 The strength uniformity of the predominant cement manufactured at a **Qualified Plant** shall be reported according to ASTM C 917 and a copy of the Uniformity Test Report shall be delivered to the **Bureau** each quarter for review (See Section 5.3). The five-sample moving average of the 7-day strength values shall not vary from an average value, established annually by the **Manufacturer**, by more than ±2.8 MPa (±406 psi).

3.7 Sample devices which are not according to ASTM C 183 may be used, if approved by the **Department**. See Attachment 1 for current sample devices approved by the Department, which are not according to ASTM C 183.

## 4.0 PORTLAND OR BLENDED CEMENT ACCEPTANCE PROCEDURES

4.1 Approval of **Cement** for use on **Department** projects will be according to one of the following two procedures:

(1) **Qualified Plant Procedure.** A **Manufacturer** desiring to avoid delays in the sampling, testing, and approval of **Cement** before use on **Department** projects, may, with **Department** approval, qualify a **Plant** to ship **Cement** for immediate use. Requirements for this procedure are contained in Section 5.0 of this policy memorandum.

The requirements for the **Qualified Plant Procedure** may be modified if the **Department** elects to enter into a reciprocal testing and reporting agreement with another state agency in which the **Plant** is located. A copy of a typical reciprocal agreement with another state is attached (see Attachment 4).

(2) **Non-Qualified Plant Procedure.** **Cement** from a **Plant** other than a **Qualified Plant** will be sampled, tested, and approved by the **Bureau** for compliance with the requirements in this policy memorandum, before it is

used on **Department** projects. Requirements for this procedure are contained in Section 6.0 of this policy memorandum.

## 5.0 QUALIFIED PLANT PROCEDURE

**Note**: The following procedure references Type I portland cement; however, it shall be the predominant **Cement** manufactured at the **Plant**.

5.1 A **Manufacturer** requesting qualification of a North American **Plant** shall provide the following to the **Bureau**:

(1) The **Plant** name and location.

(2) A certification that the **Plant** production meets the requirements of Section 3.0.

(3) A 3-month strength uniformity report prepared in accordance with the requirements of ASTM C 917, "Standard Test Method for Evaluation of Cement Strength Uniformity From a Single Source."

(4) A copy of the latest **CCRL** inspection report of the **Plant's** testing laboratory, including documentation of resolution of any discrepancies noted.

(5) The estimated average 7- and 28-day strength levels of Type I cement to be shipped by the **Manufacturer** in the subsequent 12-month period.

(6) The type of each **Processing Addition**, and the percent range that will be used in Type I **Cement**.

At the time of application, the **Manufacturer** shall obtain a 24-hour **composite Preliminary (PRE) Sample** of Type I cement from current production according to ASTM C 183. The **Manufacturer** shall split the **PRE** sample and place one portion in an airtight container and deliver it to the **Bureau**. The **Manufacturer** shall assume the cost to deliver the sample to the **Bureau**. The size of the **Bureau's** portion of the **PRE** sample shall not be less than 3 kg (6 lb.) and the sample shall be properly identified as required in Attachment 2. The **Manufacturer** shall test the retained portion of the **PRE** sample for the standard physical and chemical properties listed in ASTM C 150 and deliver a copy of the test results (see Attachment 3) to the Bureau for comparison. In addition, the **Manufacturer** shall deliver a minimum of one sample a month as required in Section 5.5.

The **Bureau** will evaluate the results obtained on all samples from the **Manufacturer** for conformance to Section 3.0 and determine if additional samples are needed.

An inspector from the **Bureau** may conduct a scheduled visit to inspect the laboratory facilities for the **Plant**; the **Plant** manufacturing process; the **Plant** storage facilities; and the quality control policies, procedures, and practices performed at the **Plant**. The **Manufacturer** shall be responsible for payment of transportation, per diem (meals), lodging, and incidental travel costs incurred by the **Bureau** inspector if the trip from the **Bureau** to the **Plant**, the **Plant** inspection, and the return trip to the **Bureau** cannot be completed within one day's normal work hours of 8:00 AM to 4:30 PM.

The **Bureau** will notify the **Manufacturer**, in writing, if the request for qualification is approved or denied. A request may be denied if the **Manufacturer** fails to meet the requirements of Sections 2.0, 3.0, 5.0, or for other reasons determined by the **Department**.

5.2 Quality Control Requirements for **Qualified Plants**:

(1) The Manufacturer shall establish and maintain quality control policies and procedures for sampling and testing the finished product, in addition, to other quality control practices. Quality control programs shall be made available for review by the **Bureau** upon request.

(2) The **Manufacturer's** testing laboratory shall participate in the **CCRL** program of the **NIST**, which includes inspection of facilities and testing of comparative samples. The **Manufacturer** shall deliver a copy of the report of the most recent **CCRL** inspection to the **Bureau** upon request.

5.3 Reporting Requirements for **Qualified Plants**:

(1) The **Manufacturer** shall deliver a Uniformity Test Report to the **Bureau** each quarter. Sampling, testing, and reporting shall be done according to the methods in ASTM C 917, "Standard Test Method for Evaluation of Cement Strength Uniformity from a Single Source."

The Uniformity Test Report shall be delivered to the Bureau no later than 40 calendar days after the end of the quarter (i.e. the end of March, June, September, and December). If the deadline falls on a Saturday, Sunday, or State Holiday, the deadline shall be the next work day.

(2) The **Manufacturer** shall provide to the **Bureau**, by January 31st of each year, the estimated average 7- and 28-day strength levels of the Type I cement that will be shipped in the subsequent 12-month period.

(3) The **Manufacturer** shall provide to the **Bureau**, by January 31st of each year, the type of each **Processing Addition**, and the percent range that will be used in the manufacture of Type I **Cement**.

5.4 Record Requirements for **Qualified Plants**:

(1) Records of production control tests shall be maintained by the **Manufacturer** for a minimum period of 5 years, and shall be made available to the **Bureau** upon request.

(2) Copies of bills of lading of quantities of **Cement** shipped shall be maintained by the **Manufacturer** for a minimum period of 3 years, and shall be made available to the **Bureau** upon request.

5.5 Sampling and Test Requirements for **Qualified Plants**:

(1) In March, June, September, and December, unless otherwise specified by the **Bureau**, the **Manufacturer** shall obtain a **Process Control (PRO) Grab Sample** of Type I cement, according to ASTM C 183, which shall be split for testing by the **Manufacturer** and the **Bureau**. The **Bureau** may require that more frequent **PRO Grab Samples** be obtained and tested. Increasing the sampling frequency may be required due to a significant change in the cement, such as a change in use of processing addition(s); variations in test results between the **Bureau** and **Manufacturer**; field test results; or other reasons as determined by the **Bureau.** The split sample shall be taken during the specified month, and shall be delivered to the **Bureau** no later than the last work day of the month. The **Bureau** sample shall be placed in an airtight container and properly identified as required in Attachment 2. The **Manufacturer** shall assume the cost to deliver the sample to the **Bureau**. The size of the **Bureau** sample shall not be less than 3 kg (6 lb.).

(2) The **Manufacturer** shall test the retained portion of each **PRO** sample for the standard physical and chemical properties listed in ASTM C 150, and record the information required by Attachment 3. When all tests are completed, the **Manufacturer** shall complete Attachment 3 and deliver the results to the **Bureau** no later than the last work day of the following month from the date of sample. (Contact the **Bureau** when forms for blended cement samples are required.)

(3) The test results obtained by the **Manufacturer** and the **Bureau** on all split samples will be compared for compliance with the allowable differences for two different laboratories set forth in the precision statement of each test method and for compliance with Section 3.0. If significant differences exist in the split sample test results, the **Department** will investigate sampling and test procedures, or require additional comparative sampling to determine the cause of the variation.

5.6 **Department** Inspections of **Qualified Plants**:

(1) An inspector from the **Bureau** may conduct unscheduled visits to each **Qualified Plant** or one of its terminals. During this visit, the inspector will either take or witness the taking of a random **Independent Assurance (IND) grab sample** according to ASTM C 183. The Inspector will split the sample and deliver an equal portion to the **Manufacturer**. The **Manufacturer** shall test the retained portion of the split sample for the standard physical and chemical properties listed in the ASTM specifications and deliver the test

results (Attachment 3) to the **Bureau,** as specified in Section 5.5, for comparison and compliance with Section 3.0.

(2) The **Manufacturer** shall be responsible for payment of transportation, per diem (meals), lodging, and incidental travel costs incurred by the **Bureau** inspector if the trip from the **Bureau** to the **Plant**, the **Plant** inspection, and the return trip to the **Bureau** cannot be completed within one day's normal work hours of 8:00 AM to 4:30 PM.

(3) Random **Investigation (INV)** samples of **Cement** will be obtained at final destination by a representative of the **Department**. The representative will either take or witness the taking of the **INV** samples. **INV** samples will be **grab samples** and will be taken according to ASTM C 183. The sampling location and frequency for obtaining **INV** samples will be determined by the Bureau in consultation with the district offices. The **Bureau** will use **INV** samples to verify that **Cement** shipped from **Qualified Plants** meets the requirements of Section 3.0.

5.7 Disqualification of **Qualified Plants**:

(1) Failure of a **Qualified Plant** to meet the requirements of Sections 3.0 and 5.0 of this policy memorandum will be sufficient cause for disqualification. However, a total of three late submittals in a twelve month period for any of the following: Uniformity Test Report, **PRO Sample**, or **PRO** test results will be permitted. Disqualification will occur if a fourth late submittal occurs in a twelve month period. The **Manufacturer** will be notified in writing when the third late submittal in a twelve month period occurs.

(2) Failure to resolve significant differences in testing, as indicated by the test results obtained on **PRO** or **IND** samples split with the **Manufacturer** will be sufficient cause for disqualification.

(3) Failure to satisfactorily resolve the discrepancies in the **Manufacturer's** test equipment or test procedures noted by the **CCRL** inspector in the report will be sufficient cause for disqualification.

(4) When a **Plant** has been disqualified, the **Department** will notify the **Manufacturer** in writing.

(5) **Cement** from a **Non-Qualified Plant** will be accepted for use on **Department** projects according to Section 6.0.

(6) The **Manufacturer** may not re-apply for **Qualified Plant** status until 30 days have elapsed from the date of the written notice of disqualification.

## 6.0 NON-QUALIFIED PLANT PROCEDURE

6.1 A **Manufacturer** or **Supplier** requesting approval of **Cement** from a non-qualified **Plant** shall provide the following to the **Bureau**:

(1) **Manufacturer** name.

(2) **Plant** name and location.

(3) A current test report, in English, which indicates the standard physical and chemical composition of the cement as per Section 3.0.

(4) The type of each **Processing Addition**, and the percent range that will be used in Type I **Cement**. The **Manufacturer** or **Supplier** shall immediately notify the **Bureau** of any changes in the **Processing Additions** or the percentages.

(5) The transportation method and location at which an inspector from the **Bureau** will be able to obtain **Acceptance (ACC)** samples.

(6) If requested by the **Bureau**, the **Manufacturer** or **Supplier** shall deliver to the **Bureau** a 24-hr **composite Preliminary (PRE) Sample** of **Cement** from current shipments according to ASTM C 183. The **Manufacturer** or **Supplier** shall assume the cost to deliver it to the **Bureau**. The size of the **PRE** sample shall not be less than 3 kg (6 lb.) and the sample shall be properly identified as required in Attachment 2.

6.2 Sampling and Test Requirements for Non-Qualified Plants in North America:

(1) **Cement** from a **Non-Qualified Plant** will be sampled, tested, and approved by the **Bureau** before use on **Department** projects. The **Bureau** has the option to affix a seal to secure **Cement** in storage (i.e. silo, truck, railroad car, or barge) until the Bureau's testing is completed.

(2) Upon arrival of the **Cement** to Illinois, an inspector from the **Bureau** will obtain **Acceptance (ACC) grab samples** according to ASTM C 183. The **Bureau** will determine the number of representative samples required.

(3) The **Manufacturer** or **Supplier** may request the **Bureau** to sample the **Cement** prior to arrival in Illinois. In the event the request is approved, the **Manufacturer** or **Supplier** shall be responsible for payment of transportation, per diem (meals), lodging, and incidental travel costs incurred by the **Bureau** inspector if the trip from the **Bureau** to the **Cement** location, the sampling, and the return trip to the **Bureau** cannot be completed within one day's normal work hours of 8:00 AM to 4:30 PM. If the **Department** determines that it lacks the resources to accomplish out-of-state inspection, the **Cement** may be sampled and tested according to the procedures in Section 6.3.

(4) **Acceptance (ACC)** samples will be tested by the **Bureau** for conformance to Section 3.0, and to approve the **Cement** for use on **Department** projects.

(5) Random **Investigation (INV)** sample of **Cement** may be obtained at final destination by a representative of the **Department**. The representative will either take or witness the taking of the **INV** samples. **INV** samples will be **grab samples** and will be taken according to ASTM C 183. The sampling location and frequency for obtaining **INV** samples will be determined by the **Bureau** in consultation with the district offices. The **Bureau** will use **INV** samples to verify that the **Cement** shipped meets the requirements of Section 3.0.

6.3 Sampling and Test Requirements for Non-Qualified Plants Located Outside North America:

(1) An **Agent** of the importer shall obtain an **Independent Assurance (IND) Grab Sample** from each barge of foreign **Cement** loaded at the port of entry and destined for Illinois.

(2) The **Agent** shall split each barge **Grab Sample** and mail one portion to the **Bureau**. The other portion shall be mailed to the importer's **Cement** manufacturing **Plant** that is on the **Department's** list of qualified **Plants**. The importer of the **Cement** shall be responsible for all sampling and mailing costs.

(3) The importer's laboratory shall test its portion of each barge **Grab Sample** for the standard physical and chemical requirements of the applicable specifications (Note 1). One random barge **Grab Sample**, representing the **Cement** in each hold of the vessel shall be tested for chemical composition (Note 2).

(4) Upon completion of the tests, the importer shall deliver to the **Bureau** a certification that states the **Cement** in the vessel unloaded at the port of entry has been tested by the importer, and complies with the applicable specifications. Attached to the certification shall be a test report of all barge and hold samples. The report shall include the name of the vessel, the source of the **Cement**, the barge number, the hold number, the date the sample was taken, the quantity of **Cement** in the barge, and the physical and chemical test results obtained on the samples.

(5) The importer shall immediately notify the **Bureau** if a barge or hold sample fails to meet the applicable specification requirements.

(6) The **Bureau** will review the certification and compare the importer's test data to the test data obtained by the **Bureau** on its portion of each split sample.

(7) When the certification and the accompanying test report are examined and determined to be correct, the **Bureau** will notify the importer and the district offices that the **Cement** is approved for state projects.

(8) Random **Investigation (INV) Samples**, from one or more barges, will be taken by a **Department** inspector when the barges arrive at the Illinois terminal(s).

(9) The **Department** will reject any foreign **Cement** tested by the **Bureau**, or the importer, that does not meet the specification requirements. The **Department** may reject any barge of **Cement** wherein the differences in test values, obtained by the **Department** and the importer on the split sample, exceeds the multilaboratory precision of the test method, but the **Cement** is within specifications.

(10) Exceptions to the procedures above will be considered for **Cements** which have an acceptable quality history, and which have previously been approved by the **Department**.

(11) Requests for reduced sampling and testing of **Cement** in particular vessels shall be directed to the **Bureau of Materials and Physical Research** for approval.

*Note 1. **Cements** certified as meeting the physical requirements of ASTM C 150, or ASTM C 595, shall be tested for autoclave expansion, normal consistency, air content, Gillmore time of set, Blaine fineness, and 3- and 7-day compressive strength.*

*Note 2. There are cases where the optimum sulfur trioxide (using ASTM Test Method C 563) of a cement exceeds the applicable specification limit. In such cases, it is permissible to exceed the specification limit, provided it has been demonstrated (by ASTM Test Method C 1038) that the increased sulfur trioxide will not develop expansion in water exceeding 0.020% at 14 days. The importer shall deliver supporting test data to the **Bureau** for each vessel of **Cement** supplied, under this provision, to Illinois.*

## 7.0 ACCEPTANCE OF CEMENT

7.1 **Cement** will be accepted according to the **Department's** current "Standard Specifications for Road and Bridge Construction," current special provisions, and this policy memorandum.

7.2 The **Bureau** will maintain and circulate a current list of **Qualified Plants** which meet the requirements of this policy memorandum. This list will include the name, location, and Producer/Supplier Number of each **Qualified Plant**. These **Plants** may ship **Cement** for immediate use on **Department** projects.

7.3 **Cement** from **Non-Qualified Plants** will be sampled, tested, and approved by the **Bureau** before use on **Department** projects.

7.4 **Cement** from foreign plants will be accepted according to the procedures in Section 6.3.

## 8.0 REJECTION OF CEMENT

8.1 **Cement** that fails to conform to the requirements of Section 3.0 of this policy memorandum shall be rejected for use on **Department** projects.

8.2 The **Bureau** will notify the **Manufacturer** or **Supplier** when **Cement** is rejected for use on **Department** projects.

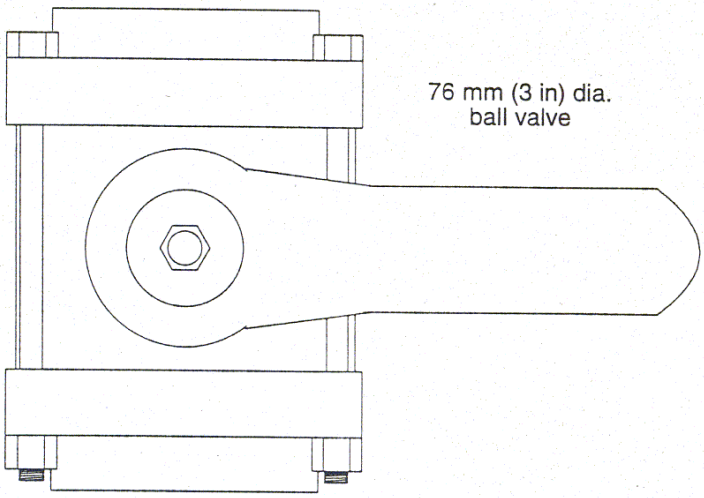
David L. Lippert, P.E.
Acting Engineer of Materials
and Physical Research

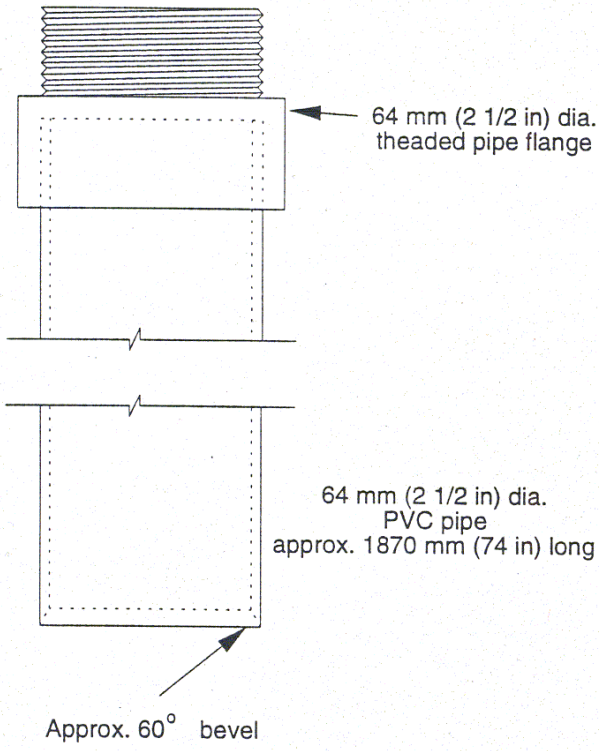
Attachments

This policy memorandum supersedes Policy Memorandum 04-02, dated January 15, 2004.

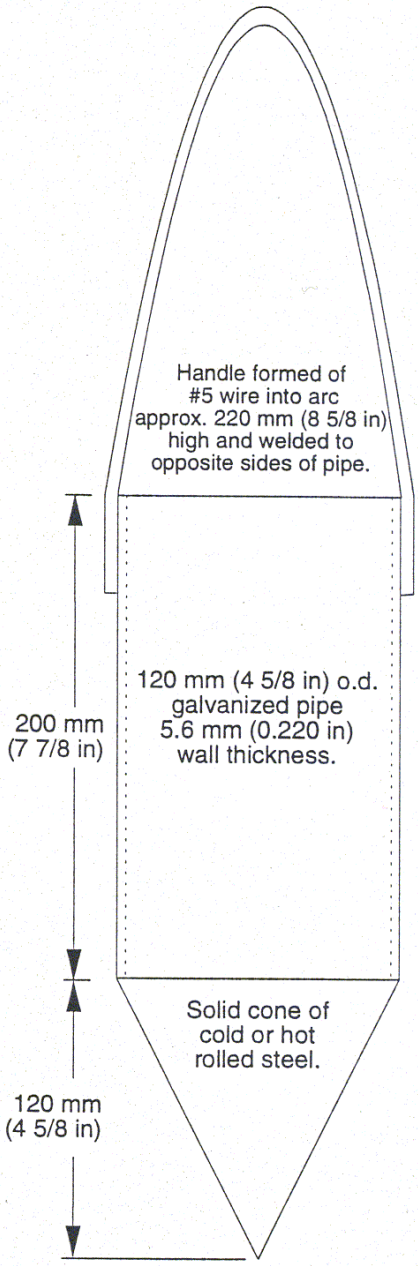
DAD/kkt

## Vacuum Type Bulk Cement Sampler



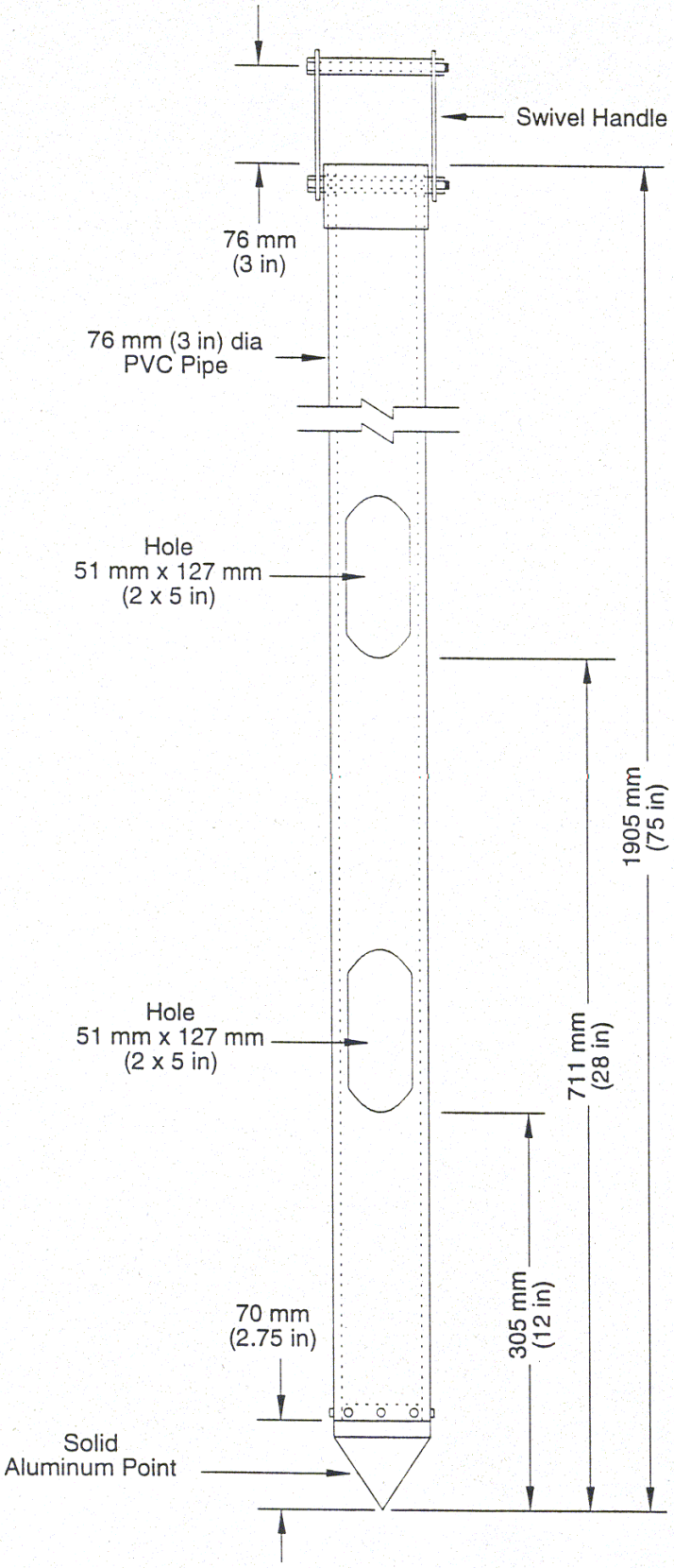




## Drop Type Bulk Cement Sampler




Note:
Total mass weight of sampler not less than 6 kg (13 lb)

# Tube Type Bulk Cement Sampler



## CEMENT / FINELY DIVIDED MINERALS
## PRE / PRO SAMPLE IDENTIFICATION

SUBJECT: ☐ Preliminary (PRE) Sample

☐ Process Control (PRO) Sample

*[Indicate the type of sample (PRE or PRO) by checking the appropriate box]*

1. Manufacturer/Supplier Name: _____
2. Name and Location of Source of Material: _____

   _____
3. Material Name (i.e. Cement, Fly Ash, GGBF Slag, etc.): _____
4. Material Type, Class or Grade: _____
5. Date Sample Was Taken: _____
6. Identification Number (If Used): _____
7. Sample Taken From (i.e. Truck, Silo, etc.): _____
8. Remarks: _____

**Instructions:** Include this sample identification sheet with each PRE / PRO Sample and mail to:

Illinois Department of Transportation
Bureau of Materials and Physical Research
126 East Ash Street
Springfield, Illinois 62704-4766
ATTN: Concrete Products Engineer

**Attachment 3**

**PORTLAND CEMENT PRODUCER'S TEST REPORT**

**DATE SAMPLED:**

**PRODUCER NO:** _____

**NAME:** _____

**LOC:** _____

**CEMENT TYPE:** _____

| | |
|---|---|
| **SAMPLED FROM:** | **TRUCK #** |
| (Completely Identify) | **BARGE #** |
| | **RAILROAD CAR #** |
| | **STORAGE SILO #** |
| | **BILL OF LADING #** |

**PRODUCER'S SAMPLE NO:**

**INSTRUCTIONS:** Complete all three pages of this form and mail to:

Illinois Department of Transportation
Bureau of Materials and Physical Research
126 E. Ash St.
Springfield, Illinois 62704-4766
ATTN: Concrete Products Engineer

**Attachment 3**

DTT03601

**REPORT OF PHYSICAL TESTS**

NAME OF TESTER: _____

**TEST OF SOUNDNESS (ASTM C 151)**

INITIAL READING: _____ mm _____ in.

FINAL READING: _____ mm _____ in.

% EXPANSION: _____

**TEST OF GILLMORE TIME SETS (ASTM C 266)**

INITIAL SET (HR:MIN) _____ MINUTES: _____

FINAL SET (HR:MIN) _____ MINUTES: _____

**TEST OF NORMAL CONSISTENCY (ASTM C 187)**

Water: _____ ml %: _____

**TEST OF AIR CONTENT (ASTM C 185)**

Water: _____ ml Wt: _____ g Flow: _____ % % AIR: _____

**TEST OF COMPRESSIVE STRENGTH (ASTM C 109)**

3 DAY LOADS, N: _____ | _____ | _____ kPa: _____

*-OR-*

(lb): _____ | _____ | _____ (psi): _____

7 DAY LOADS, N: _____ | _____ | _____ kPa: _____

*-OR-*

(lb): _____ | _____ | _____ (psi): _____

28 DAY LOADS, N: _____ | _____ | _____ kPa: _____

*-OR-*

(lb): _____ | _____ | _____ (psi): _____

**BLAINE FINENESS (ASTM C 204)**

AIR FLOW, TIME - SEC: _____

FACTOR, F: _____ FINENESS, SQ m/kg: _____

REMARKS: _____

*Instructions: The indicated ASTM tests are required to be performed with the exception of the 3-day compressive strength test, which is optional. Test results may be reported in either SI or English units; however, SI units are preferred.*

DTT03207

**REPORT OF CHEMICAL TESTS**

NAME OF TESTER: _____

**TEST OF CHEMICAL ANALYSIS (ASTM C 114**

INSOLUBLE RESIDUE, %: _____

LOSS ON IGNITION, %: _____

SULFUR TRIOXIDE, %: _____

MAGNESIUM OXIDE, %: _____

SILICON DIOXIDE, %: _____

FERRIC OXIDE, %: _____

ALUMINUM OXIDE, %: _____

CALCIUM OXIDE, %: _____

SODIUM OXIDE, %: _____

POTASSIUM OXIDE, %: _____

CARBON DIOXIDE, %: _____ (WHEN LIMESTONE ADDITION IS USED)

TRICALCIUM SILICATE, %: _____

DICALCIUM SILICATE, %: _____

TRICALCIUM ALUMINATE, %: _____

TETRACALCIUM ALUMINOFERRITE, %: _____

TOTAL CALCULATED COMPOUNDS, %: _____

REMARKS: _____

**INSTRUCTIONS:** *The ASTM chemical tests performed on the PRO sample shall include all the tests on this form.*

**NOTE:** *The aluminum oxide content shall not include phosphorus pentoxide and titanuim dioxide. Adjustments to the Bogue calculation are to be made when limestone addition is used.*

(FOR BUREAU USE ONLY)

DATE ENTERED:_____

MISTIC ID NO:_____

INITIALS:_____

# ARTICLES OF AGREEMENT
# FOR
# PORTLAND CEMENT PLANT ACCEPTANCE

BETWEEN THE STATE OF _____
AND THE STATE OF _____

FOR CEMENT FROM: _____CEMENT COMPANY

FACILITY LOCATED AT: _____

1. The host state agency will require the portland cement plant within its boundaries to have a laboratory compliant with ASTM C1222, "Standard Practice for Evaluation of Laboratories Testing Hydraulic Cement." This lab will perform testing on the applicable type of cement (ASTM C150/AASHTO M85, ASTM C595/AASHTO M240, and C1157) produced and shipped for state agencies consumption. AASHTO accreditation for hydraulic cement testing of the applicable cement types is acceptable. Agency laboratories used for verification testing must meet the same criteria.

2. The host agency will require the portland cement plant within its boundaries to have a printed, agency acceptable quality control/quality assurance plan for the production of cements used by state agencies. The plan must include commitments to comply with ASTM C1222 and ASTM C183, "Standard Practice for Sampling and the Amount of Testing of Hydraulic Cement." The host state agency will verify compliance with the quality control plan.

3. The host state agency will require the cement producer to maintain and provide, for all lots of cement shipped, a compilation of mill test reports in an electronic form. The applicable data will be provided to the host state agency at a frequency of _____.

4. The host state agency will require the cement producer to submit two split samples of a regular portland cement (ASTM C150/AASHTO M85) and a blended portland cement (ASTM C595/AASHTO M240) or performance specification cement (ASTM C1157), if produced, at a frequency of _____ for verification testing. The second sample shall be retained for independent analysis if needed.

5. The host state agency will require the cement producer to submit reports for ASTM C917, "Standard Test Method for Evaluation of Cement Strength Uniformity From a Single Source" for both a regular portland cement and a blended portland cement, if produced, at a frequency of _____. In lieu of ASTM C917 sampling and testing, production data may be analyzed and reported for the non-predominant cements manufactured at a cement plant.

6. The host state agency will require the cement producer to maintain production and quality control/quality assurance records for at least seven years and make those records available if requested.

7. The host state agency will review submittals from the cement producer along with agency test results. If deficiencies are discovered, the state agency will monitor corrective actions taken by the producer until the deficiencies are corrected. The reciprocal agreement state agency will be notified of the deficiencies and of each occurrence.

8. Any test results or submittals collected by the host state agency may be made available to the reciprocal agreement state agency upon request.

9. All portland cement plant information and data is confidential within the limits of a public agency and is for state agencies information and inspection only.

10. Quality assurance test results of field samples, performed by a reciprocal state, shall be reported to the host state agency when a non-compliance occurs. The reciprocal state agency will deal directly with the cement producer. The host state agency will take action as described in Item 7. The host state agency shall notify all reciprocal agreement state agencies when a non-compliance occurs.

11. Portland cement tests or requirements beyond the standards stated above may be provided to reciprocal state agencies by agreement between the host state agency and reciprocal state agencies.

Materials Engineer: _____ State of _____ Date_____

Materials Engineer: _____ State of _____ Date _____